



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	TSUHAN CHEN: "Elimination of subband-coding artifacts using the dithering technique" PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON IMAGE PROCESSING (ICIP) AUSTIN, NOV. 13 - 16, 1994, LOS ALAMITOS, IEEE COMP. SOC. PRESS, US, vol. 3 CONF. 1, 13 November 1994 (1994-11-13), pages 874-877, XP010146153 ISBN: 0-8186-6952-7	1-5,8, 16-21, 24,32	H04N7/26 H04N7/50
Y	* the whole document *	6,7,22, 23	
X	EP 0 509 576 A (AMPEX) 21 October 1992 (1992-10-21) * abstract * * page 13, line 24 - line 58 * * figure 7 *	1,3,5, 8-11,16, 17,19, 21, 24-27,32	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Y		12-15, 28,29,31	H04N
X	PETRI D: "Dither signals and quantization" MEASUREMENT, INSTITUTE OF MEASUREMENT AND CONTROL. LONDON, GB, vol. 19, no. 3, 1 November 1996 (1996-11-01), pages 147-157, XP004059590 ISSN: 0263-2241 * paragraph '0001! - paragraph '0003! * * figures 2,4 * -/--	1-3,5, 17-19, 21,32	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 31 July 2003	Examiner Wahrenberg, A.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.02 (PotCo1)



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IntCl.7)
Y	PAPOULIS A: "Probability, random variables, and stochastic processes" 1991 , MCGRAW-HILL XP002248174 * page 101 * * figures 5-18 * * page 136 - page 137 * * figures 6-9 *	6,7,22, 23	
Y	WANG J ET AL: "DYNAMIC RATE SCALING OF CODED DIGITAL VIDEO FOR IVOD APPLICATIONS" IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, IEEE INC. NEW YORK, US, vol. 44, no. 3, 2 June 1998 (1998-06-02), pages 743-749, XP000669576 ISSN: 0098-3063	12,28	
A	* abstract * * paragraph '00IV! *	9-11	
Y	WO 01 95633 A (GEN INSTRUMENT CORP ;CHEN XUEMIN (US); PANUSOPONE KRIT (US)) 13 December 2001 (2001-12-13) * page 31, line 12 - page 35, line 25 *	13-15, 29,31	
			TECHNICAL FIELDS SEARCHED (IntCl.7)
The present search report has been drawn up for all claims			
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<div>CATEGORY OF CITED DOCUMENTS</div> <div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div> <div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</div>			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 00 2443

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-07-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0509576 A	21-10-1992	AT 162918 T	15-02-1998
		CA 2063972 A1	19-10-1992
		DE 69224227 D1	05-03-1998
		DE 69224227 T2	09-07-1998
		EP 0509576 A2	21-10-1992
		JP 5153406 A	18-06-1993
		KR 252594 B1	15-04-2000
		MX 9201788 A1	01-02-1993
		US 5930398 A	27-07-1999
WO 0195633 A	13-12-2001	AU 6702301 A	17-12-2001
		CA 2410573 A1	13-12-2001
		EP 1287704 A2	05-03-2003
		WO 0195633 A2	13-12-2001

Extended European Search Report

This application is covered by the extended European search report pilot project at present running within the European Patent Office, applied to all European patent applications filed as first filing and searched on or after 01.07.03. Under this project the EPO issues together with the search report an opinion on whether the application and the invention to which it relates meet the requirements of the EPC. This non-binding opinion is issued free of charge as a service. This opinion may be used as the basis for an informed decision as to whether it is desired to pursue the application further or not.

For further details of this pilot project, the applicant's attention is directed to the Official Journal edition 5/2003. If any further immediate questions or comments arise the EPO Customer Services: +31-70-340 4500 or +49-89-2399 2828 can be contacted.

The examination has revealed that the application or the invention to which it relates appear **not** to meet the requirements of the Convention (see comments on enclosed Form 2906).

If the applicant wishes to continue with this application the examination fee must be paid. Where appropriate amendments can be filed to address the objections raised in the opinion, thus shortening the overall procedure. If no amendments are filed, the opinion will be re-issued as the first official communication under Article 96(2) and Rule 51(2) EPC.

If the examination fee has already been paid and the right to the communication under Article 96(1) EPC has been waived for this application, the first official communication under Article 96(2) and Rule 51(2) EPC will be issued promptly.



The examination is being carried out on the **following application documents**:

Text for the Contracting States:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT SE SI SK TR LI

Description, pages:

1-41 as originally filed

Claims, No.:

1-32 as originally filed

Drawings, sheets:

1/3 as originally filed

The following documents, cited in the search report, are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

- D1: Chen T: "Elimination of subband-coding artifacts using the dithering technique" Proceedings Of The International Conference On Image Processing (icip) Austin, Nov. 13 - 16, 1994, Los Alamitos, IEEE Comp. Soc. Press, Us (13-11-1994), 3 CONF. 1, 874-877
- D2: EP-A-0509576
- D3: Papoulis A "Probability, random variables, and stochastic processes", McGraw-Hill, 1991, pages 101 and 136-137.
- D4: Wang J et al: "Dynamic rate scaling of coded digital video for IVOD applications" IEEE Transactions On Consumer Electronics, IEEE Inc. New York, Us (02-06-1998), 44(3), 743-749
- D5: WO-A-0195633

1. The application does not meet the requirements of Article 84 EPC, because claims 13 and 29 are not clear since it is not clear what is meant by "a transcoding process between an input stream of digital signals at a first bitrate and an ~~output bitrate~~ *at a second bitrate*".

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2. The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1-5, 8, 16-24 and 32 is not new in the sense of Article 54(1) and (2) EPC.



2.1. Either of D1 or D2 discloses a method of converting digital signals between a first and second format (D1, abstract (the first format is the uncompressed signal and the second format the compressed signal) and D2, page 3, lines 3-5), the method including the step of generating coefficients representative of such digital signals and the step of subjecting such coefficients to quantization (D1, abstract and D2, abstract) characterized in that it includes the steps of:

- generating a dither signal (D1, paragraph 2 and D2, page 7, lines 2-5), and
- adding said dither signal to said coefficients before said quantization to generate a quantized signal (D1, paragraph 2 and D2, page 7, lines 2-5).

Therefore, the subject-matter of claim 1 is not new (Article 54(1) and (2) EPC).

2.2. D1 discloses dithered quantization with a uniform quantization step (paragraph 2).

Therefore, the subject-matter of claim 2 is not new (Article 54(1) and (2) EPC).

2.3. D2 further discloses the steps of

- subjecting said quantized signal to inverse quantization, and
- subtracting said dither signal from said signal subjected to inverse quantization (page 13, lines 53-56).

Therefore, the subject-matter of claim 3 is not new (Article 54(1) and (2) EPC).

2.4. D1 discloses a method for dithered quantization including the steps of:

- subjecting each coefficient to a first quantization step in the absence of any dither signal being added, to generate an undithered quantized coefficient,
- checking if said undithered quantized coefficient is equal to zero, and
- when said undithered quantized coefficient is equal to zero, taking said undithered quantization coefficient as said quantized signal, and
- when said undithered quantized coefficient is different from zero, adding said dither signal to said coefficient and subjecting said dither coefficient to a quantization step to generate said quantized signal (paragraph 2, section Remarks, point 2).

Therefore, the subject-matter of claim 4 is not new (Article 54(1) and (2) EPC).

2.5. Either of D1 or D2 discloses a dither signal of which the spectrum is selected from the group consisting of Gaussian, uniform, sinusoidal and triangular (D1, paragraph 2 and D2, page 8 lines 2-4).

Therefore, the subject-matter of claim 5 is not new (Article 54(1) and (2) EPC).

2.6. Either of D1 or D2 discloses subjecting a digital signal to a discrete cosine transform to generate the coefficients to which the dither signal is added before the coefficients being quantized as DCT coefficients (D1, abstract; paragraph 4 and D2, page 8 lines 37-39).

Therefore, the subject-matter of claim 8 is not new (Article 54(1) and (2) EPC).



2.7. D2 discloses a transcoding process between an input stream of digital signals at a first bit rate and an output stream of digital signals at a second bit rate (page 3, lines 9-12; figure 1), said second bit rate of said output stream of digital signals being selectively controlled (page 3, line 57 - page 4 line 7).

Therefore, the subject-matter of claim 9 is not new (Article 54(1) and (2) EPC).

2.8. D2 further discloses a preanalysis process including:

- quantizing the signals with a given quantization step (mquant), and
- evaluating the number of bits spent for coding said coefficients, and in that said bit rate of said output data stream is controlled as a function of said preanalysis (page 4, line 48-54).

Therefore, the subject-matter of claim 10 is not new (Article 54(1) and (2) EPC).

2.9. D2 further discloses a transcoder in which the bit rate control is of a proportional-integrative type (page 3, line 57 - page 4 line 7).

Therefore, the subject-matter of claim 11 is not new (Article 54(1) and (2) EPC).

2.10. D1 further discloses dithered quantization applied to MPEG encoded signals (paragraph 4).

Therefore, the subject-matter of claim 16 is not new (Article 54(1) and (2) EPC).

2.11. The subject-matter of claim 17-21 and 24-27 corresponds to that of claim 1-5 and 8-11, of which claim 17-21 and 24-27 are mirrors in terms of physical units.

Therefore, the objections raised in respect of claim 1-5 and 8-11 also apply to claim 17-21 and 24-27.

2.12. D1 discloses a computer program product directly loadable in the internal memory of a digital computer and including software code portions (paragraph 4. NB note 3) for performing the method of claims 1-5, 8, 16-21, 24, and 32 (see above comments).

Therefore, the subject-matter of claim 32 is not new (Article 54(1) and (2) EPC).

3. The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 6, 7, 12-15, 22, 23 and 28-31 does not involve an inventive step in the sense of Article 56 EPC.

3.1. D3 discloses modification of a uniform distribution to obtain the distribution function of any distribution $F_y(y)$ (page 101), e.g. Gaussian or triangular distribution.

D3 is a general textbook on probability theory and random variables. Undoubtedly, the skilled person has the knowledge required to be able to apply probability theory in his field of competence. Therefore, the subject-matter of claim 6 is not inventive (Article 56).

3.2. D3 further discloses generation of a random variable with a PDF $f(x,y)$ from two independent



random variables x and y with probability density functions $f_x(x)$ and $f_y(y)$ respectively (page 136- 137, figure 6-9).

Applying this theory to generated a pseudo-random noise signal does not involve an inventive step for the skilled person (see also point 2.1). Therefore the subject-matter of claim 7 lacks inventive step (Article 56 EPC).

3.3. D4 discloses a transcoder with a two pass encoder in which the input stream is a stream of digital video signals including pictures arranged in groups of pictures, and wherein said bit rate control assign value of target bits for each single picture of a group of pictures (paragraph IV).

The skilled person would when combining the transcoder of D4 with the one of D2 arrive at the same subject-matter as in claim 12 and therefore, this claim is not inventive (Article 56 EPC).

3.4. D5 discloses a transcoding process between an input stream of digital signals at a first bit rate and an output bit stream at a second bit rate (page 10, lines 5-7), said transcoding process including subjecting at least part of said input digital signals to a low pass filtering step followed by a downsampling step (page 31 lines 13-17; page 38, lines 15-17).

It is obvious for the skilled person that when combining the dithered quantization method of either D1 or D2 with the size transcoder of D5, one arrives at the same solution as claimed in claim 13. Therefore, claim 13 does not involve an inventive step (Article 56 EPC).

3.5. In D5, the low-pass filtering and decimation is applied to the DCT-coefficients before quantization. This is normally the way downconversion is performed. Therefore, when combining the features of claim 10 with the features of claim 13, it is natural to perform the decimation step before the preanalysis.

Hence, it is obvious for the skilled person to combine D2 (see point 1.9) with D5 (point 2.4) in order to arrive at the subject matter of claim 14. Therefore, claim 14 does not involve an inventive step (Article 56).

3.6. D5 further discloses a rate scaling transcoder in which together with the low-pass filtering a decimation step is executed (page 31 lines 13-17; page 38, lines 15-17).

In accordance with the reasoning of point 2.4, it is obvious for the skilled person that D5 could be combined with either D1 or D2 to arrive at the subject-matter of claim 15, which is therefore not inventive (Article 56 EPC).

3.7. The subject-matter of claim 22, 23 and 28-31 corresponds to that of claim 6, 7 and 12-15, of which claim 22, 23 and 28-31 are mirrors in terms of physical units.

Therefore, the objections raised in respect of claim 6, 7 and 12-15 also apply to claim 22, 23 and 28-31.

4. The applicant is invited to take into consideration the above comments.